METHOD AND APPARATUS FOR CUTTING DEVICES FROM SUBSTRATES

Inventor: Kuo-Ching LIU

CROSS REFERENCE TO RELATED APPLICATION

[0001] The present application is a continuation-in-part of co-pending U.S. Patent Application No. 10/288,719, filed on 11/05/02 now Patent No. 6,806,544 entitled METHOD AND APPARATUS FOR CUTTING DEVICES FROM CONDUCTIVE SUBSTRATES SECURED DURING CUTTING BY VACUUM PRESSURE, filed 5 November 2002 which is incorporated by reference as if fully set forth herein; and

[0002] The present application is also a continuation-in-part of co-pending U.S. Patent Application No. 10/384,439, entitled SCRIBING SAPPHIRE SUBSTRATES WITH A SOLID STATE UV LASER, filed 6 March 2003; which is a continuation of U.S. Patent Application No. 10/208,484, filed 30 July 2002, now U.S. Patent No. 6,580,054 which is incorporated by reference as if fully set forth herein; which claims the benefit of U.S. Provisional Application No. 60/387,381, filed 10 June 2002.

BACKGROUND OF THE INVENTION

Field of the Invention

[0003] The present invention relates to systems and processes used in manufacturing integrated device die, such as integrated circuits and laser diodes, including diode lasers formed on substrates. More particularly, the present invention provides for securing wafers having substrates, during the process of cutting the wafers into individual die, and further provides for securing the die separated from the wafers during and after the wafer cutting process.

Description of Related Art

[0004] Sapphire Al_2O_3 is used as a substrate for the growth of Gallium Nitride GaN in commercial laser diode manufacturing systems, and can also act as the substrate of the finished product. However, the use of sapphire substrates introduces certain problems.

[0005] For instance, sapphire is an electrical insulator and this causes problems when it is used as a wafer substrate in the fabrication of laser diodes. Because it is an insulator, electrical contacts to the diodes are usually placed on the wafer's active